ANALYSIS OF INDIAN STOCK MARKET EFFICIENCY

A DISSERTATION REPORT

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CERTIFICATE

This is to certify that the dissertation entitled "**Analysis of Indian stock market efficiency**" which is being submitted in partial fulfillment for the requirement for the award of M.S (Oil Trading) by Mr. Atul choudhary is a bonafide work carried out by him under my supervision and guidance. This work has not been published elsewhere or submitted for the award of any other degree.

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Atul Choudhary

Abstract

The present study examines empirically the day of the week effect anomaly in the Indian equity market for the period from 2002 to 2007 using both high frequency and end of day data for the benchmark Indian equity market index S&P CNX NIFTY. Using robust regression with biweights and dummy variables, the study finds that before introduction of rolling settlement in January 2002, Monday and Friday were significant days. However after the introduction of the rolling settlement, Friday has become significant. This also indicates that Fridays, being the last days of the weeks have become significant after rolling settlement. Mondays were found to have higher standard deviations followed by Fridays. The existence of market inefficiency is clear. The market inefficiency still exists and market is yet to price the risk appropriately.

It is often argued that if stock markets are efficient then it should not be possible to predict stock returns, namely that none of the variables in the stock market regression should be statistically significant. Some writers have even gone so far as to equate stock market efficiency with the non-predictability property. But this line of argument is not satisfactory and does not help in furthering our understanding of how markets operate. The concept of market efficiency needs to be defined separately from predictability. In fact, it is easily seen that stock market returns will be non-predictable only if market efficiency is combined with risk neutrality.

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Chapter 1

1.1 Need of the Study

Stock market has developed into one of the major source from where Indian company raises money needed for their expansion. Market capitalization of Indian stock market is increasing over many year as more and more participants are entering into the market.

With more and more funds flowing into the market there is serious need to study the efficiency, reliability and stability of stock market. Efficiency can be measued by looking at the depth of market, leverage, volatility in the market.

This report tries to find out the liquidity of the stock market and how volatile the Indian market is?

1.2 Objective of the study

- ✓ To find out whether the Indian Stock Market is efficient or not.
- ✓ To measure if share prices were affected by information published in company reports.
- ✓ To see that the present price is influenced by the past price or not that is the closing index

1.3 Research Methodology

As far as the topic of my dissertation is concerned which is confined to the analysis of the Indian stock market efficiency , by the term efficient market we mean, A market in which prices always "fully reflect" available information and to carry on my research I have taken care of the qualitative and quantitative approach . Within the qualitative approach I have gone through the various journals , books , magazines, and research papers which helped me in ending up to the inferences regarding the Indian stock market efficiency whether it is efficient or not and how far the present market is influenced by the past one and is there any sort relevant factors which influence the

present market and beyond this there are few parameters through which we can know that market is efficient or not to some extent , but no individual can determine the efficiency of the Indian market

Apart from going through the qualitative approach , the second methodology which is followed in the report is the use of statistical tools like regression analysis which has been use to analyze t or predict the relationship between the past and the present price . I have taken the nifty index closing price and applied the regression model, the time periods of the data which I have taken is of five years that is from 2002- 2007 . The source of data is basically primary source which has been collected from various sites like NSE,Yahoo finance.com

Chapter 2

LITERATURE REVIEW

Previous studies of stock market efficiency:

- Since the 1950's, a great deal of event studies has been accomplished in the field of finance. Results achieved from event studies have been an important source for decision making in corporate finance. It is considered as a literature which is scientifically useful.
- The most extensive study of the efficiency on the Swedish stock market was made in the 1980's, by Kerstin Claesson (1987). She divided her study into six smaller parts, each part concentrating on one type of information. The study was mainly about testing the weak form efficiency. Claesson's (1987) conclusion was that the Swedish stock market was not entirely efficient. But she also stated that even because of this, the Swedish stock market should be considered more or less efficient (Claesson, 1987).
- A test of the semi-strong form of efficiency was made by Fama, Fisher, Jensen and Roll. They used a method called residual analysis to measure the stock market efficiency, during a stock split. Their research indicated that the market was efficient, in the sense that share prices adapted to new information very fast.
- Forsgardh and Hertzen (1975) conducted a test on the Swedish stock market. Their research was to study the semi-strong form of market efficiency on the Swedish stock market. They had two purposes with their research. The first one was to measure if share prices were affected by information published in company reports. The second purpose was to see if the change in share prices was efficient. They came up with the result that information affects share prices and that the change in share prices was efficient (Forsgårdh & Hertzen, 1975).
- The study conducted by Sir Manoj Dalvi examines empirically the day of the week effect anomaly in the Indian equity market for the period from 1999 to 2003 using both high frequency and end of day data for the benchmark Indian equity market index S&P CNX NIFTY. Using robust regression with biweights and dummy variables, the study finds that before introduction of rolling settlement in January 2002, Monday and Friday were significant days. However after the introduction of the rolling settlement, Friday has become significant. This also indicates that Fridays, being the last days of the

weeks have become significant after rolling settlement. Mondays were found to have higher standard deviations followed by Fridays. The existence of market inefficiency is clear. The market inefficiency still exists and market is yet to price the risk appropriately.

- The study done by peter Blair Henry about the Indian stock markets liberalization its economic reform and the emergence of the market equity prices reflects about the efficiency of the Indian market A stock market liberalization is a decision by a country's government to allow foreigners to purchase shares in that country's stock market. On average, a country's aggregate equity price index experiences abnormal returns of 3.3 percent per month in real dollar terms during an eight-month window leading up to the implementation of its initial stock market liberalization. This result is consistent with the prediction of standard international asset pricing models that stock market liberalization may reduce the liberalizing country's cost of equity capital by allowing for risk sharing between domestic and foreign agents.

- The study on revisiting market efficiency: the stock market complex adaptive system done by Sir Michael J. Mauboussin, states that it is time to shift the emphasis on the market efficiency , most academicians and practitioners agree that markets are efficient by reasonable operational criterion there is no systematic way to exploit opportunities for superior gains but we need to reorient the discussion how this efficiency arises . the crux of the debate boils down to whether we should considers investors to be rational , well informed , and homogeneous , the backbone of standard capital market theory or potentially irrational operating with incomplete information and relying on varying decisions rules The latter characteristics are part and parcel of relatively newly articulated phenomenon that researchers at the Santa Fe Institute and elsewhere call complex adaptive systems.

Chapter 3

Introduction to Indian Stock Market

The S&P CNX 500 is India's first broad-based stock market index of the Indian stock market. The S&P CNX 500 represents about 96% of total market capitalization and about 93% of the total turnover on the National Stock Exchange of India (NSE).

The S&P CNX 500 companies are disaggregated into 72 Industry indices, the S&P CNX Industry Indices. Industry weights in the index reflect the industry weights in the market. For e.g. if the banking sector has a 5% weight in the universe of stocks traded on the NSE, banking stocks in the index would also have an approximate representation of 5% in the index.

Stock market

The term 'the stock market' is a concept for the mechanism that enables the trading of company stocks (collective shares), other securities, and derivatives. Bonds are still traditionally traded in an informal, over the conter market known as the bond market Commodities are traded in commodities markets , and derivatives are traded in a variety of markets (but, like bonds, mostly 'over-the-counter').

The size of the worldwide 'bond market' is estimated at $45 trillion. The size of the 'stock market' is estimated as about half that. The world derivatives market has been estimated at about $300 trillion. The major U.S. Banks alone are said to account for about $100 trillion. It must be noted though that the derivatives market, because it is stated in terms of notional outstanding amounts, cannot be directly compared to a stock or fixed income market, which refers to actual value.

The stocks are listed and traded on stock exchanges which are entities (a corporation or mutual organization) specialized in the business of bringing buyers and sellers of stocks and securities together. The stock market in the United States includes the trading of all securities listed on the NYSE, the NASDAQ, the Amex, as well as on the many regional exchanges, the OTCBB, and Pink Sheets. European examples of stock exchanges include

the Paris Bourse (now part of Euronext), the London Stock Exchange and the Deutsche Börse.

Participants in the stock market range from small individual stock investors to large hedge fund traders, who can be based anywhere. Their orders usually end up with a professional at a stock exchange, who executes the order

Some exchanges are physical locations where transactions are carried out on a trading floor, by a method known as open outcry. This type of auction is used in stock exchanges and commodity exchanges where traders may enter "verbal" bids and offers simultaneously. The other type of exchange is a virtual kind, composed of a network of computers where trades are made electronically via traders at computer terminals.
Actual trades are based on an auction market paradigm where a potential buyer bids a specific price for a stock and a potential seller asks a specific price for the stock. (Buying or selling at market means you will accept any bid price or ask price for the stock.) When the bid and ask prices match, a sale takes place on a first come first served basis if there are multiple bidders or askers at a given price.

The purpose of a stock exchange is to facilitate the exchange of securities between buyers and sellers, thus providing a marketplace (virtual or real). The exchanges provide real-time trading information on the listed securities, facilitating price discovery.

Market participants

Many years ago, worldwide, buyers and sellers were individual investors, such as wealthy businessmen, with long family histories (and emotional ties) to particular corporations. Over time, markets have become more "institutionalized"; buyers and sellers are largely institutions (e.g., pension funds, insurance companies, mutual funds, hedge funds, investor groups, and banks). The rise of the institutional investor has

brought with it some improvements in market operations. Thus, the government was responsible for "fixed" (and exorbitant) fees being markedly reduced for the 'small' investor, but only after the large institutions had managed to break the brokers' solid front on fees (they then went to 'negotiated' fees, but only for large institutions).
However, corporate governance (at least in the West) has been greatly affected by the rise of institutional 'owners.'

History

Braudel suggests that in Cairo in the 11th century Islamic and Jewish merchants had already set up every form of trade association and had knowledge of every method of credit and payment, disproving the belief that these were invented later by Italians. In 12th century France the courratiers de change were concerned with managing and regulating the debts of agricultural communities on behalf of the banks. Because these men also traded with debts, they could be called the first brokers. In late 13th century Bruges commodity traders gathered inside the house of a man called Van der Beurse, and in 1309 they became the "Brugse Beurse", instituionalizing what had been, until then, an informal meeting. The idea quickly spread around Flanders and neighboring counties and "Beurzen" soon opened in Ghent and Amsterdam. In the middle of the 13th century Venetian bankers began to trade in government securities. In 1351 the Venetian government outlawed spreading rumors intended to lower the price of government funds. Bankers in Pisa, Verona, Genoa and Florencealso began trading in government securities during the 14th century. This was only possible because these were independent city states not ruled by a duke but a council of influential citizens. The Dutch later started joint stock companies, which let shareholders invest in business ventures and get a share of their profits - or losses. In 1602, the Dutch East India Company issued the first shares on the Amsterdam Stock Exchange. It was the first company to issue stocks and bonds. The Amsterdam Stock Exchange (or Amsterdam Beurs) is also said to have been the first stock exchange to introduce continuous trade in the early 17th century. The Dutch "pioneered short selling, option trading, debt-equity

swaps, merchant banking, unit trusts and other speculative instruments, much as we know them" (Murray Sayle, "Japan Goes Dutch", London Review of Books XXIII.7, April 5, 2001. There are now stock markets in virtually every developed and most developing economies, with the world's biggest markets being in the United States, Canada, China (Hong Kong), India, UK, Germany, France and Japan.

Importance of stock market

Function and purpose

The stock market is one of the most important sources for companies to raise money. This allows businesses to go public, or raise additional capital for expansion. The liquidity that an exchange provides affords investors the ability to quickly and easily sell securities. This is an attractive feature of investing in stocks, compared to other less liquid investments such as real estate

History has shown that the price of shares and other assets is an important part of the dynamics of economic activity, and can influence or be an indicator of social mood. Rising share prices, for instance, tend to be associated with increased business investment and vice versa. Share prices also affect the wealth of households and their consumption. Therefore, central banks tend to keep an eye on the control and behavior of the stock market and, in general, on the smooth operation of financial system functions. Financial stability is the raison d'être of central banks.

Exchanges also act as the clearinghouse for each transaction, meaning that they collect and deliver the shares, and guarantee payment to the seller of a security. This eliminates the risk to an individual buyer or seller that the counterparty could default on the transaction.

The smooth functioning of all these activities facilitates economic growth in that lower costs and enterprise risks promote the production of goods and services as well as employment. In this way the financial system contributes to increased prosperity.

Relation of the stock market to the modern financial system

The financial system in most western countries has undergone a remarkable transformation. One feature of this development is disintermediation. A portion of the funds involved in saving and financing flows directly to the financial markets instead of being routed via banks' traditional lending and deposit operations. The general public's heightened interest in investing in the stock market, either directly or through mutual funds, has been an important component of this process. Statistics show that in recent decades shares have made up an increasingly large proportion of households' financial assets in many countries. In the 1970s, in Sweden, deposit accounts and other very liquid assets with little risk made up almost 60 per cent of households' financial wealth, compared to less than 20 per cent in the 2000s. The major part of this adjustment in financial portfolios has gone directly to shares but a good deal now takes the form of various kinds of institutional investment for groups of individuals, e.g., pension funds, mutual funds, hedge funds, insurance investment of premiums, etc. The trend towards forms of saving with a higher risk has been accentuated by new rules for most funds and insurance, permitting a higher proportion of shares to bonds. Similar tendencies are to be found in other industrialized countries. In all developed economic systems, such as the European Union, the United States, Japan and other developed nations, the trend has been the same: saving has moved away from traditional (government insured) bank deposits to more risky securities of one sort or another

The stock market, individual investors, and financial risk

Riskier long-term saving requires that an individual possess the ability to manage the associated increased risks. Stock prices fluctuate widely, in marked contrast to the stability of (government insured) bank deposits or bonds. This is something that could

affect not only the individual investor or household, but also the economy on a large scale. The following deals with some of the risks of the financial sector in general and the stock market in particular. This is certainly more important now that so many newcomers have entered the stock market, or have acquired other 'risky' investments (such as 'investment' property, i.e., real estate and collectables).

With each passing year, the noise level in the stock market rises. Television commentators, financial writers, analysts, and market strategists are all over talking each other to get investors' attention. At the same time, individual investors, immersed in chat rooms and message boards, are exchanging questionable and often misleading tips. Yet, despite all this available information, investors find it increasingly difficult to profit. Stock prices skyrocket with little reason, then plummet just as quickly, and people who have turned to investing for their children's education and their own retirement become frightened. Sometimes there appears to be no rhyme or reason to the market, only folly.

This is a quote from the preface to a published biography about the well-known and long term value oriented stock investor Warren Buffet Buffet began his career with only 100 U.S. dollars and has over the years built himself a multibillion-dollar fortune. The quote illustrates some of what has been happening in the stock market during the end of the 20th century and the beginning of the 21st.

The behavior of the stock market

From experience we know that investors may temporarily pull financial prices away from their long term trend level. Over-reactions may occur— so that excessive optimism (euphoria) may drive prices unduly high or excessive pessimism may drive prices unduly low. New theoretical and empirical arguments have been put forward against the notion that financial markets are efficient.

According to the efficient market hypothesis , only changes in fundamental factors, such as profits or dividends, ought to affect share prices. (But this largely theoretic academic viewpoint also predicts that little or no trading should take place— contrary to fact— since prices are already at or near equilibrium, having priced in all public knowledge.) But the efficient-market hypothesis is sorely tested by such events as the stock market crash in 1987, when the Dow Jones index plummeted 22.6 percent — the largest-ever one-day fall in the United States. This event demonstrated that share prices can fall dramatically even though, to this day, it is impossible to fix a definite cause: a thorough search failed to detect any specific or unexpected development that might account for the crash. It also seems to be the case more generally that many price movements are not occasioned by new information; a study of the fifty largest one-day share price movements in the United States in the post-war period confirms this. Moreover, while the EMH predicts that all price movement (in the absence of change in fundamental information) is random (i.e., non-trending), many studies have shown a marked tendency for the stock market to trend over time periods of weeks or longer.

Various explanations for large price movements have been promulgated. For instance, some research has shown that changes in estimated risk, and the use of certain strategies, such as stop-loss limits and Value at Risk limits, theoretically could cause financial markets to overreact.

Other research has shown that psychological factors may result in exaggerated stock price movements. Psychological research has demonstrated that people are predisposed to 'seeing' patterns, and often will perceive a pattern in what is, in fact, just noise. (Something like seeing familiar shapes in clouds or ink blots.) In the present context this means that a succession of good news items about a company may lead investors to overreact positively (unjustifiably driving the price up). A period of good returns also boosts the investor's self-confidence, reducing his (psychological) risk threshold.

Another phenomenon— also from psychology— that works against an objective assessment is group thinking. As social animals, it is not easy to stick to an opinion that differs markedly from that of a majority of the group. An example with which one may be familiar is the reluctance to enter a restaurant that is empty; people generally prefer to have their opinion validated by those of others in the group.

In one paper the authors draw an analogy with gambling. In normal times the market behaves like a game of roulette; the probabilities are known and largely independent of the investment decisions of the different players. In times of market stress, however, the game becomes more like poker (herding behavior takes over). The players now must give heavy weight to the psychology of other investors and how they are likely to react psychologically.

The stock market, as any other business, is quite unforgiving of amateurs. Inexperienced investors rarely get the assistance and support they need. In the period running up to the recent NASDAQ crash, less than 1 per cent of the analyst's recommendations had been to sell (and even during the 2000 - 2002 crash, the average did not rise above 5%). The media amplified the general euphoria, with reports of rapidly rising share prices and the notion that large sums of money could be quickly earned in the so-called new economy stock market. (And later amplified the gloom which descended during the 2000 - 2002 crash, so that by summer of 2002, predictions of a DOW average below 5000 were quite common.)

Irrational behavior

Sometimes the market tends to react irrationally to economic news, even if that news has no real effect on the technical value of securities itself. Therefore, the stock market can be swayed tremendously in either direction by press releases, rumors and mass panic .

Furthermore, the stock market comprises a large amount of speculative analysts, or pencil pushers, who have no substantial money or financial interest in the market, but make market predictions and suggestions regardless. Over the short-term, stocks and other securities can be battered or buoyed by any number of fast market-changing events, making the stock market difficult to predict.

Stock market index

The movements of the prices in a market or section of a market are captured in price indices called stock market indices, of which there are many, e.g., the S&P, the FTSE and the Euronext indices. Such indices are usually market capitalization (the total market value of floating capital of the company) weighted, with the weights reflecting the contribution of the stock to the index. The constituents of the index are reviewed frequently to include/exclude stocks in order to reflect the changing business environment.

Derivative instruments

Financial innovation has brought many new financial instruments whose pay-offs or values depend on the prices of stocks. Some examples are exchange traded funds (ETFs), stock index and stock options, equity swaps, single-stock futures, and stock index futures. These last two may be traded on futures exchanges (which are distinct from stock exchanges—their history traces back to commodities futures exchanges), or traded over-the-counter. As all of these products are only derived from stocks, they are sometimes considered to be traded in a (hypothetical) derivatives market, rather than the (hypothetical) stock market.

Leveraged Strategies

Stock that a trader does not actually own may be traded using short selling; margin buying may be used to purchase stock with borrowed funds; or, derivatives may be

used to control large blocks of stocks for a much smaller amount of money than would be required by outright purchase or sale.

Short selling

In short selling, the trader borrows stock (usually from his brokerage which holds its clients' shares or its own shares on account to lend to short sellers) then sells it on the market, hoping for the price to fall. The trader eventually buys back the stock, making money if the price fell in the meantime or losing money if it rose. Exiting a short position by buying back the stock is called "covering a short position." This strategy may also be used by unscrupulous traders to artificially lower the price of a stock. Hence most markets either prevent short selling or place restrictions on when and how a short sale can occur. The practice of naked shorting is illegal in most (but not all) stock markets.

Margin buying

In margin buying, the trader borrows money (at interest) to buy a stock and hopes for it to rise. Most industrialized countries have regulations that require that if the borrowing is based on collateral from other stocks the trader owns outright, it can be a maximum of a certain percentage of those other stocks' value. In the United States, the margin requirements have been 50% for many years (that is, if you want to make a $1000 investment, you need to put up $500, and there is often a maintenance margin below the $500). A margin call is made if the total value of the investor's account cannot support the loss of the trade. (Upon a decline in the value of the margined securities additional funds may be required to maintain the account's equity, and with or without notice the margined security or any others within the account may be sold by the brokerage to protect its loan position. The investor is responsible for any shortfall following such forced sales.) Regulation of margin requirements (by the Federal Reserve) was implemented after the Crash of 1929. Before that, speculators typically only needed to put up as little as 10 percent (or even less) of the total investment

represented by the stocks purchased. Other rules may include the prohibition of free-riding: putting in an order to buy stocks without paying initially (there is normally a three-day grace period for delivery of the stock), but then selling them (before the three-days are up) and using part of the proceeds to make the original payment (assuming that the value of the stocks has not declined in the interim).

New issuance

Global issuance of equity and equity-related instruments totaled $505 billion in 2004, a 29.8% increase over the $389 billion raised in 2003. Initial public offerings (IPO's) by US issuers increased 221% with 233 offerings that raised $45 billion, and IPO's in Europe, Middle East and Africa (EMEA) increased by 333%, from $ 9 billion to $39 billion.

Investment strategies

One of the many things people always want to know about the stock market is, "How do I make money investing?" There are many different approaches; two basic methods are classified as either fundamental analysis or technical analysis. Fundamental analysis refers to analyzing companies by their financial statements found in SEC Filings, business trends, general economic conditions, etc. Technical analysis studies price actions in markets through the use of charts and quantitative techniques to attempt to forecast price trends regardless of the company's financial prospects. One example of a technical strategy is the Trend following method, used by John W. Henry and Ed Seykota, which uses price patterns, utilizes strict money management and is also rooted in risk control and diversification.

Additionally, many choose to invest via the index method. In this method, one holds a weighted or unweighted portfolio consisting of the entire stock market or some segment of the stock market (such as the S&P 500 or Wilshire 5000). The principal aim of this strategy is to maximize diversification, minimize taxes from too frequent trading,

and ride the general trend of the stock market (which, in the U.S., has averaged nearly 10%/year, compounded annually, since World War II).

Finally, one may trade based on inside information, which is known as insider trading.

List of stock exchanges

This is a list of stock exchanges. Those futures exchanges that also offer trading in securities besides trading in futures contracts are listed both here and the List of futures exchanges

Ten Largest Stock Exchanges by Market Capitalization (in trillions of US dollars

- New York Stock Exchange (merged with Euronext) - $15.47
- Tokyo Stock Exchange - $4.74
- NASDAQ - $3.91
- Euronext (merged with NYSE) - $3.88
- London Stock Exchange - $3.84
- Frankfurt Stock Exchange (Deutsche Börse) - $1.76
- Toronto Stock Exchange - $1.75
- Hong Kong Stock Exchange - $1.73
- Madrid Stock Exchange (BME Spanish Exchanges) - $1.39
- Shanghai Stock Exchange - $1.30

Other Large Regional Stock Exchanges by Market Capitalization (in trillions of US dollars)

- SWX Swiss Exchange - $1.26
- Australian Stock Exchange - $1.20
- Milan Stock Exchange (Bursa Italian) - $1.07
- Moscow Interbank Currency Exchange - $0.86 (January 2007)
- Korea Exchange - $0.84
- Bombay Stock Exchange - $0.82
- Johannesburg Securities Exchange - $0.79
- Bovespa - $0.78

- National Stock Exchange of India - $0.77

Indian exchanges

- Ahmedabad Stock Exchange
- Bangalore Stock Exchange
- Bhubaneswar Stock Exchange(BhSE)
- Bombay Stock Exchange (BSE)
- Calcutta Stock Exchange
- Cochin Stock Exchange
- Coimbatore Stock Exchange
- Delhi Stock Exchange Association
- Gawahati Stock Exchange
- Hyderabad Stock Exchange
- Inter-connected Stock Exchange of India
- Jaipur Stock Exchange
- Ludhiana Stock Exchange Association
- Madhya Pradesh Stock Exchange
- Madras Stock Exchange
- Mangalore Stock Exchange
- National Stock Exchange of India(NSE)
- OTC Exchange of India
- Pune Stock Exchange
- Saurashtra-Kutch Stock Exchange
- 21Uttar Pradesh Stock Association
- Vadodara Stock Exchange

Chapter 4

Theoretical aspect of market efficiency

4.1 Market efficiency

The EMH has had a significant impact on finance for almost fifty years. The first discussion about market efficiency originated in the 1950's when the definition random walk came about The definition advocated that changes in the stock market did not follow any regular pattern. The field of academic finance in general, and particularly the analysis of securities, was created on the basis of the EMH. Many empirical findings have been proved to support the hypotheses. Michael Jensen, a graduate from Chicago, and also one of the creators of the EMH, stated in 1978 that 'there is no other proposition in economics which has more solid empirical evidence supporting it than the Efficient Market Hypothesis.

A market could be said to be efficient when there is no undervalued or overvalued shares. The price is set in an accurate way, that is, in equilibrium and therefore the return of the shares will be equal to the expected return .

The basis of the EMH can be divided into two categories. First, when information affecting the share price reaches the market, the information should be incorporated both quickly and correctly and establish a new equilibrium price. By quickly means that those who receive this news early should not be able to profit from it, for example by reading it in the newspapers or in company reports. The price adjusts before the investor has time to trade on it. Correctly means that adjustment of the prices after the news have been revealed should be accurate, meaning that the investors should not under react or overreact to any particular information. The second category states that security prices should not shift without any news affecting its value.

Namely, changes in demand and supply of a security should not arise if news announcements do not concern the security's fundamental value. That is to say, nonreaction to non-information and quick and accurate reaction to information are two important aspects of EMH .

There are some obstacles that can affect the market's ability to reflect all available information.To be able to call a market fully efficient it is adequate that the following four conditions are fulfilled:

- All investors are determined to maximize their value. They are rational and only invest if the return is the highest possible given the level of risk.
- All information is available for all investors at the same time and free of charge.
- There are no costs for trading on the market, for example taxes, transaction costs, or any other costs.
- No investor is big enough to, alone, affect the price of shares.

In a market with these features the current price of a security obviously fully reflects all available information. These conditions are sufficient for market efficiency, but not necessary. Therefore, a market can be said to be efficient, even though information is not freely available to all market operators or if investors disagree about current information and current price.

According to Fama (1970, p.383), A market in which prices always "fully reflect" available information is called "efficient". He divided all work concerning market efficiency into three categories: weak form, semi-strong and strong-form.

4.1.1 Weak form

The weak form market efficiency assumes that the stock market has taken all historical data about the share into consideration when the share price is being set. For example, there is no point in buying shares after it has gone up three days in a row, by believing it will rise a fourth day just because it has risen three days before. No other information such as earnings, forecast, merger announcement, or money-supply figures are being used . If a change in share price is about to take place, the weak form efficient market would make sure that the price adjustment happens immediately. No profits could be made since share prices auto correlate to historical information. Another aspect of weak

form market efficiency is that because share prices do not follow any specific pattern, share return is unpredictable.

The market has no memory whereas everything happen randomly, therefore the movement of share prices according to the weak form efficiency is called *random walk*. In a given day, share prices could rise independently of the previous day's increase or decline. Therefore investors can not use past information to make extraordinary profits. If there were patterns in share prices, everyone would be able to exploit it, and this process would cause them to disappear . However, the random walk does not disagree with that forecasting future returns with past information is incorrect; instead it says that the *sequence* of past returns can not be used to forecast future returns, meaning that the sequence happens randomly (Fama, 1970).

4.1.2 Semi-strong form

The next level of market efficiency is, according to Fama (1970), the semi-strong form. This form of market efficiency is fulfilled when the market has taken all historical data *and* other public information regarding share prices, i.e. annual reports or company announcements into consideration when pricing a share. No investor should be able to make abnormal returns by trying to predict the return of shares, using any public information. For instance, consider a presentation of a company report to the public with the news of increased earnings.

An investor might want to invest in the share after hearing the news, believing that it might cause a rise in share price. In the semi-strong form of market efficiency, the price should adjust to the higher equilibrium price immediately upon the news release.

Hence, the investor will end up paying the higher price and not earning any abnormal profit.

In the semi-strong form of efficiency, all investors are expected to look through financial magic, for example a change in accounting standards that causes the earnings to rise

without an effect in cash-flow. To be able to measure if investors react correctly to this kind of information, an event study is used. Event studies are statistical studies that examine if release of information is followed by correct abnormal returns .

The event study is a semi-strong test, conducted to investigate price adjustments of securities that are caused by a recent event. The reason for an event study examination can be to see whether there are any abnormal investor behaviors that arise when the event is revealed. In other words, the event study will identify the difference between the real share return and its expected return, i.e. the abnormal return (Fama, 1970). The abnormal return (AR) for a share a given day is calculated by taking the actual return of the share (R), subtracted by the market return on the same day (Rm); that is, AR=R-Rm. The abnormal return at time t should reflect the information released at time t, if market efficiency holds..

Event studies also measures cumulative abnormal returns (CAR). When measuring CARs, the abnormal returns for each day is subtracted from the day before If abnormal return for day *t-1* is -2%, *t* is 3%, and *t1* is 5% the CARs would be -2%, 1%, and 6% .

Keown and Pinkerton (1981) investigated the reaction of share prices in semi strong form, before and after the announcement of a new event. The event concerned returns to target companies of takeover bids, showing the development of target companies' share price when they were given bids from potential acquiring companies. The study shows that share prices began to rise prior to the announcement of the bid, and then adjusted their selves to an equilibrium price on the date of the announcement. The new price adjustment was not followed by an up or down movement, but instead it was followed by a fixed trend This method of testing the semi-strong form efficiency has been performed on events such as changes in dividends or profits, CEO replacements, investments, and acquisitions. The EMH holds in many of these studies.

4.1.3 Strong form

When both historical data and public information are reflected in share prices, and investors are incapable to make any abnormal returns, there is another type of information that is not yet known to market participants. This kind of information is known as *inside information,* and can be used by investors to make abnormal returns.

If the market is efficient according to Fama' (1970) third category of market efficiency, the strong form, even inside information can not help investors to make any abnormal returns as the information quickly leaks out and is reflected in share prices.

In this form of efficiency, there are no secrets in the market that only a limited group of people have access to . Academic studies have been performed to see whether an insider could make an abnormal profit using not publicly known information.

The strong form of efficiency is questioned to hold when evidence in the real world market has shown that insider traders have been making illegal profits.

4.1.4 Foundation of market efficiency

According to Shleifer (2000), market efficiency will be achieved if any one of the following three conditions is fulfilled; *Rationality, Independent deviations from rationality,* and *arbitrage.*

Investors are assumed to be *rational* in the stock market, meaning that they will value each share in a rational way and for its fundamental value. Investors will quickly act in response to good news by bidding up prices and bidding them down when the news is bad. This implies that investors have incorporated all information available immediately and adjust prices to a new equilibrium. It is perhaps too much to ask that all of the investors should act rational. But, market efficiency will still hold if there are independent deviations from rationality

Times when investors are not acting totally rational, market efficiency holds because their trades are random and will cancel each other out without affecting prices .This is called *independent deviations from rationality*. Assume that investors are willing to overpay for new shares for some reason. This will cause the share price to rise beyond what the market efficiency would expect. An overreaction of share prices is created, that is not consistent with the EMH. However people can also react negatively to new information, for instance people have always been skeptical to new inventions like the telephone, the copier, and the automobile. If that is the case, the rise in share price would be less than it should be, according to the EMH. Consequently if we suppose that there are as many irrational optimistic investors as there are irrational pessimistic investors in the market, the market efficiency would still be consistent as the rise in price would be on an average rate. However, there can be times when, for some reason, a majority of investors are excessive optimistic or pessimistic. But even in this situation, the occurrence of arbitrage produces efficiency

A definition of *arbitrage* could be described as *'the simultaneous purchase and sale of the same, or essentially similar, security in two different markets at advantageously different prices.'* Assume that a share is overpriced relative to its fundamental value as a result of irrational investors. This share represent a bad buy and smart investors, or arbitrageurs, would sell this expensive shares and simultaneously purchase other similar but cheaper shares. A profit would be made. If there are many arbitrageurs that are competing with each other to earn profits in the market, the share price could hardly get much higher than its fundamental value. The effect of this is to bring the overpriced share to its fundamental value. The process of arbitrage selling and buying shares can still bring share prices to its fundamental value even though not all investors are acting rationally. Hence, the market could still be efficient

4.1.5 Inefficient markets

There are some disagreements concerning the three conditions that create market efficiency. Many members of the academic community claim that none of the above mentioned conditions is consistent in reality. Individuals are not always acting in a rational way. A gambler for instance, bet on black at roulette table after black has occurred a couple of times in a row, believing that the run will continue. This way of thinking is not rational as the roulette table has no memory .

Psychologists have argued that deviation from rationality has long been in accordance with some principles. One of them is *representative ness,* which could be described using the example of the gambler. Even though the gambler believes that black is the color in the next round, after it has occurred several times in a row, there is still only a 50% chance that it will happen again. The gambler obviously believes that the small sample he observed is representative enough to draw a conclusion. The same can be reflected into finance when for example, Internet shares, having a short history of high revenue growth in the late 1990, are expected to continue forever by investors. This turned out not to be the case Representative ness tends to lead to an overreaction in share returns

Another principle, *conservatism,* signifies that people are too slow in adjusting their beliefs to new information. This behavior tends to lead to an under reaction of share returns where the actual price rise is less than what the market had predicted. Prices which adjust slowly to the information contained in announcements of earnings are said to hold up to the principle of conservatism. The conclusion is that, because of representativeness and conservatism, the market is inefficient.

Concerning professional investors, arbitrageurs, that could bring share prices to its fundamental value, others claim that this method of trading is more risky than it seems. Selling a large amount of one share and buying a large amount of another share is quite risky. The cheaper shares might not be available in the market and there might be many

irrational investors in the market. This causes a need of perhaps few professionals in the market to take big positions in order to bring back prices to their fundamental value. Otherwise the market would still be inefficient as the shares are over- or under priced.

Chapter 5

Parameters to judge market efficiency

As the topic concerned is confined to the analysis of Indian stock market efficiency, so there had to be some parameters which determines the efficiency of the market, as per the research taking into consideration the following key factors determine the efficiency of the market:

- FII's (foreign institutional investment)
- Mutual funds
- Date of issue of IPO'S
- Announcement of various companies report
- Bonus issues
- Effect of global market
- Appreciation of home currency
- Various government policies
- Big acquisitions by various companies

Apart from these factors taken into account there can be fundamental analysis being carried of to know wether the market is efficient or not The above mentioned factors are amongst the few points which ends up in determing the efficiency of the market , but at the same time its very difficult to judge wether any market is efficient or not . No individual or anyone can determine the efficiency of market its really an unpredictable pattern which is being carried of along with these factors which adds up the same

Chapter 6

Analysis and Interpretation of Results

Data of Nifty Index

Data is collected from nifty index within the time periods between 2002 -2007.

Data is when examined from its previous day close and analyzed through regression model (see appendix for calculation) its is analyzed that current day market prices are very much influenced by previous day close.

The data includes many variation from various sources. Indian stock market is not so mature that it cant be influenced by external factors. Indian stock market is weak form .

R square is 99.93 that means the current day data is highly dependent that is 99.93% dependent on the previous day price

The percentile of standard error is 33.45%

P value is 68.04% that means that the market is not efficient and it is influenced by the previous day data that is previous price price.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.99939403
R Square	0.99878843
Adjusted R Square	0.99878752
Standard Error	33.4583195
Observations	1338

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	1232928970	1232928970	1101361.3	0
Residual	1336	1495597.414	1119.459142		
Total	1337	1234424568			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*
Intercept	0.88836838	2.156672921	0.41191614	0.68046697	-3.342465678
X Variable 1	1.00067122	0.000953513	1049.457619	0	0.998800671

Upper 95%	*Lower 95.0%*	*Upper 95.0%*
5.119202	-3.34247	5.119202
1.002542	0.998801	1.002542

Chapter-7

Conclusion

After studying all the factors which are incorporated with the Indian exchanges shows that there are few reasons to Indian market being weak , now this research paper presents some receipe to eliminate with the weaknesses of the Indian exchanges . as it is well known that frequent fluctuation in the price is the major cause of worry for the Indian exchanges, which is due to lack of sustaining huge capital in he market therefore govt should take some actions regarding the short term flow of the capital from the market, as well as some guidelines to restrain big players from the exchanges

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